**Unit Plan Template**

Part 1: Textbook Concept list

|  |  |  |  |
| --- | --- | --- | --- |
| Concept | Definitely Include? | Maybe Include? | Don’t Include? |
| Interactions and interdependence of life | **X** |  |  |
| Levels of organization | **X** |  |  |
| Ecological methods | **X** |  |  |
| Photosynthesis and Chemosynthesis | **X** |  |  |
| Producers and consumers | **X** |  |  |
| Feeding relationships | **X** |  |  |
| Ecological Pyramids | **X** |  |  |
| Cycles of Matter | **X** |  |  |
| Nutrient Limitation | **X** |  |  |

Part II: Illinois Learning Standards Concept List

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Concept | Descriptor | Definitely Include? | Maybe Include? | Don’t Include? |
| Interactions and interdependence of life | Stage H 12B 3 | **X** |  |  |
| Levels of organization | Stage H 12B 1 | **X** |  |  |
| Ecological methods | Stage H 11A 3 | **X** |  |  |
| Photosynthesis and Chemosynthesis | Stage H 12A 1 | **X** |  |  |
| Producers and consumers | Stage I 12B 2 | **X** |  |  |
| Feeding relationships | Stage I 12B 2 | **X** |  |  |
| Ecological Pyramids | Stage I 12B 2 | **X** |  |  |
| Cycles of Matter | Stage H 12A 1 | **X** |  |  |
| Nutrient Limitation | Stage I 12B 1 | **X** |  |  |

Use the table below to complete part 3 of your Unit Plan Assignment

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Concept | This Unit? | Another Unit? | Leave Out? | Rationale | Related ILS |
| Interactions and interdependence of life | **X** |  |  | This concept is important in understanding how life is interdependent and interconnected. | Stage H 12B 3 |
| Levels of organization | **X** |  |  | This section will help the students understand how the biosphere is organized and on what scale we are focusing | Stage H 12B 1 |
| Ecological methods | **X** |  |  | It is necessary to know the scientific methods involved in research. | Stage H 11A 3 |
| Photosynthesis and Chemosynthesis | **X** |  |  | These processes are the basis for the producer and consumer relationship. | Stage H 12A 1 |
| Producers and consumers | **X** |  |  | The roles of producers and consumers are integral to the food chain and trophic levels. | Stage I 12B 2 |
| Feeding relationships | **X** |  |  | This topic builds on the last few to show how energy flows in nature. | Stage I 12B 2 |
| Ecological Pyramids | **X** |  |  | This concept helps to show students the energy requirements of each trophic level. | Stage I 12B 2 |
| Cycles of Matter | **X** |  |  | This concept is important in teaching students how important nutrients and compounds cycle through the biosphere. | Stage H 12A 1 |
| Nutrient Limitation | **X** |  |  | This concept helps students to understand the limiting factors for life and growth. | Stage I 12B 1 |

Use the table below to complete parts 4 & 5 of your Unit Plan Assignment.

|  |  |
| --- | --- |
| Concept | Objective(s) TSWBAT: |
| Interactions and interdependence of life | 1. Define Ecology and Biosphere |
| Levels of organization | 1. Define a species. 2. List the levels of organization in order of size. 3. Identify differences between each level of organization. |
| Ecological methods | 1. Discuss the methods used by ecologists to study living things and their environment. |
| Photosynthesis and Chemosynthesis | 1. Write out the equations for photosynthesis and chemosynthesis. 2. Discuss the process by which plants produce biomass and energy. 3. Identify the differences between photosynthesis and chemosynthesis. |
| Producers and consumers | 1. Define the roles of producers and consumers in an ecosystem. 2. Identify examples of producers and consumers. 3. Discuss the importance of detritivores and decomposers. |
| Feeding relationships | 1. Outline a food chain and food web. 2. Identify trophic levels within the food chain. |
| Ecological Pyramids | 1. Draw an energy pyramid, biomass pyramid and a pyramid of numbers. 2. Apply the principles that dictate the proportions of these pyramids. |
| Cycles of Matter | 1. Discuss the cyclical nature of the biosphere. 2. Outline the water, nutrient, carbon, nitrogen and phosphorous cycles. |
| Nutrient Limitation | 1. Explain nutrient limitation providing one example from nature. |

Use the table below to complete part 6 of your Unit Plan Assignment.

|  |  |  |  |
| --- | --- | --- | --- |
| Objective | Possible Teaching Strategies | Final Choice | Rationale |
| 1. Define Ecology and Biosphere | 1A. Students take notes from a PowerPoint presentation.  1B. Students watch a video and define ecology and biosphere as a class. | 1B. Students watch a video and define ecology and biosphere as a class. | Allowing the students to come up with there own definitions first would give them a chance to form their own connections to remember these words. |
| 1. Define a species. 2. List the levels of organization in order of size. 3. Identify differences between each level of organization. | 1A. Take notes from a PowerPoint.  1B. Fill out a worksheet of necessary terms.  2A. Fill out a worksheet that outlines the levels of organization.  2B. Have students list examples of levels of organization where they live.  3A. Fill out a worksheet with descriptions of each of the levels of organization. | 1B. Fill out a worksheet of necessary terms.  2A. Fill out a worksheet that outlines the levels of organization.  3A. Fill out a worksheet with descriptions of each of the levels of organization. | Instead of giving a lecture on the terms and concepts, letting students fill in a worksheet on their own would help them see how the levels of organization are divided. |
| 1. Discuss the methods used by ecologists to study living things and their environment. | 1A. Powerpoint lecture on methods.  1B. Have students use the internet to find current methods for ecology research. | 1B. Have students use the internet to find current methods for ecology research. | Having students learn about current methods for ecology is a good way to practice internet research skills and to find the most current methods. |
| 1. Write out the equations for photosynthesis and chemosynthesis. 2. Discuss the process by which plants produce biomass and energy. 3. Identify the differences between photosynthesis and chemosynthesis. | 1A. In-class demonstration and discussion  1B. Classroom activity and simulation.  2A. In-class demonstration and discussion.  2B. Classroom activity and simulation.  3A. Classroom discussion.  3B. Have students complete a worksheet comparing a contrasting photosynthesis and chemosynthesis | 1B. Classroom activity and simulation.  2A. In-class demonstration and discussion.  3B. Have students complete a worksheet comparing a contrasting photosynthesis and chemosynthesis | To teach these concepts, I would start with a demonstration and discussion about the biomass produced from photosynthesis. I would then give students an activity to do in which they would try to figure out the equations for photosynthesis and chemosynthesis. In this same activity, I would have students compare and contrast both of these processes. |
| 1. Define the roles of producers and consumers in an ecosystem. 2. Identify examples of producers and consumers. 3. Discuss the importance of detritivores and decomposers. | 1A. Short PowerPoint on producers and consumers.  1B. Classroom discussion over the roles of producers and consumers.  2A. Group work in which students must identify producers and consumers.  3A. 1A. Short PowerPoint on detritivores and decomposers.  1B. Classroom discussion over the roles of detritivores and decomposers. | 1A. Short PowerPoint on producers and consumers.  2A. Group work in which students must identify producers and consumers.  1B. Classroom discussion over the roles of detritivores and decomposers. | I think that it would be a good idea to tell students the roles of producers and consumers, have them list examples of them and then have them fill in the roles of the detritivores and decomposers. |
| 1. Outline a food chain and food web. 2. Identify trophic levels within the food chain. | 1A. Fill out a worksheet of a food chain and web.  2A. Fill in the trophic levels on a worksheet of the food chain a web. | 1A. Fill out worksheet of a food chain and web.  2A. Fill in the trophic levels on a worksheet of the food chain a web. | Filling in a worksheet would be a useful way of showing the trophic levels and filling in the food chain and web. This would make it possible to bring in examples from the student’s immediate environment. |
| 1. Draw an energy pyramid, biomass pyramid and a pyramid of numbers. 2. Apply the principles that dictate the proportions of these pyramids. | 1A. Fill out a worksheet of an energy pyramid and use the same principles to complete a biomass pyramid and pyramid of numbers.  1B. Complete a simulation to show the principles of these pyramids. | 1A. Fill out a worksheet of an energy pyramid and use the same principles to complete a biomass pyramid and pyramid of numbers.  1B. Complete a simulation to show the principles of these pyramids. | Using both of these strategies gives me the chance to introduce the topic and give the students practice with the same concepts. |
| 1. Discuss the cyclical nature of the biosphere. 2. Outline the water, nutrient, carbon, nitrogen and phosphorous cycles. | 1A. Complete activity in which students rotate around the room and rearrange cards to show the cycles.  1B. PowerPoint discussing cycles in nature. | 1A. Complete activity in which students rotate around the room and rearrange cards to show the cycles.  1B. PowerPoint discussing cycles in nature. | By using both strategies again, I can allow students to try to piece together the cycles and then I can provide more structure to their thinking by giving a presentation that discusses how cycles work in nature. |
| 1. Explain nutrient limitation providing one example from nature. | 1A. Presentation and notes.  1B. Assignment in which students give an example of this and fully explain it.  1C. Possibly a lab to show this concept. | 1A. Presentation and notes.  1B. Assignment in which students give an example of this and fully explain it.  1C. Possibly a lab to show this concept. | This portion may be a little dry. I would like to do a lab activity or something of the like to show how this works over the span of a couple days. |

Use the table below to complete part 7 of your Unit Plan Assignment.

|  |  |  |  |
| --- | --- | --- | --- |
| Objective | Possible Assessment Strategies | Final Choice | Rationale |
| 1. Define Ecology and Biosphere | 1A. Ticket out assignment.  1B. Quiz | 1A. Ticket out assignment. | This concept just provides the framework for subsequent classes. It is to early for a formal assessment although many of these concepts will appear on the unit exam |
| 1. Define a species. 2. List the levels of organization in order of size. 3. Identify differences between each level of organization. | 1A. Turn in work sheet from class.  1B. Homework assignment over the same concepts.  1C. Bell ringer activity the next day in class. | 1A. Turn in work sheet from class.  1C. Bell ringer activity the next day in class. | This would allow me to assess how the students learned the concept and how they retained it the next day. |
| 1. Discuss the methods used by ecologists to study living things and their environment. | 1A. homework assignment to be filled out while online.  1B. Quiz | 1A. homework assignment to be filled out while online. | This would be a good assignment to be done at home which would be collected the following day. |
| 1. Write out the equations for photosynthesis and chemosynthesis. 2. Discuss the process by which plants produce biomass and energy. 3. Identify the differences between photosynthesis and chemosynthesis. | 1A. Worksheet to be completed in class.  1B. Quiz | 1B. Quiz | These are very important concepts that we will likely spend some time discussing. As such, I would give a quiz over these concepts in class. |
| 1. Define the roles of producers and consumers in an ecosystem. 2. Identify examples of producers and consumers. 3. Discuss the importance of detritivores and decomposers. | 1A. Quiz  1B. Homework assignment  1C. Writing assignment. | 1B. Homework assignment  1C. Writing assignment. | These concepts lend themselves well to writing assignments that could be completed either at home or in class. |
| 1. Outline a food chain and food web. 2. Identify trophic levels within the food chain. | 1A. Quiz  1B. Project  1C. Homework assignment. | 1B. Project | I will assign a project that combines the principles of food chains and food webs with the principles of photosynthesis and chemosynthesis. |
| 1. Draw an energy pyramid, biomass pyramid and a pyramid of numbers. 2. Apply the principles that dictate the proportions of these pyramids. | 1A. In-class assignment.  1B. Quiz  1C. Ticket-out assignment. | 1A. In-class assignment. | Collecting the in-class assignment would give me the chance to se if they need any additional help on these topics. |
| 1. Discuss the cyclical nature of the biosphere. 2. Outline the water, nutrient, carbon, nitrogen and phosphorous cycles. | 1A. In class assignments  1B. Quiz | 1A. In class assignments  1B. Quiz | I see this as being a multi-day topic. I will have the students turn in work from the class period and I will also give them a quiz over the cycles after we have covered all of the material. |
| 1. Explain nutrient limitation providing one example from nature. 2. Design a lab activity to identify the limiting nutrient in an ecosystem. | 1A. In-class assignment.  1B. Lab assignment.  1C. Case study. | 1B. Lab assignment.  1C. Case study. | I would like to do either a lab assignment on this topic if possible and a case study. If possible, I would like to do both. |

Use the table below to complete part 8 of your Unit Plan Assignment.

|  |  |  |
| --- | --- | --- |
| Science Laboratory Skill | Related Objective(s)? | Teaching Strategy? |
| Students must design an experiment. | Design a lab activity to identify the limiting nutrient in an ecosystem. | After giving the students background on what a limiting nutrient is, they will design an experiment to identify the limiting nutrient in an ecosystem with a group. Students will then execute their plan in lab. |

**Unit Plan Overview (Part 9)**

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| --- | --- | --- | --- | --- |
| **Day** | **Objective** | **Teaching Strategy** | **Assessment Strategy** | **Notes** |
| 1 | Interactions and interdependence of life | 1B. Students watch a video and define ecology and biosphere as a class. | 1A. Ticket out assignment. | A television or computer is needed to watch the video clip. |
| 2 | Levels of organization | 1B. Fill out a worksheet of necessary terms.  2A. Fill out a worksheet that outlines the levels of organization.  3A. Fill out a worksheet with descriptions of each of the levels of organization. | 1A. Turn in work sheet from class.  1C. Bell ringer activity the next day in class. | The worksheet needs to be created and printed out ahead of time. |
| 3 | Ecological methods | 1B. Have students use the internet to find current methods for ecology research. | 1A. homework assignment to be filled out while online. | A computer lab needs to be reserved ahead of time for searching the internet. |
| 4 | Photosynthesis and Chemosynthesis | 1B. Classroom activity and simulation.  2A. In-class demonstration and discussion.  3B. Have students complete a worksheet comparing a contrasting photosynthesis and chemosynthesis | 1B. Quiz | The worksheet needs to be created and printed out ahead of time. |
| 5 | Producers and consumers | 1A. Short PowerPoint on producers and consumers.  2A. Group work in which students must identify producers and consumers.  1B. Classroom discussion over the roles of detritivores and decomposers. | 1B. Homework assignment  1C. Writing assignment. | Computer and projector needed. |
| 6 | Feeding relationships | 1A. Fill out worksheet of a food chain and web.  2A. Fill in the trophic levels on a worksheet of the food chain a web. | 1B. Project | The worksheet needs to be created and printed out ahead of time. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Day** | **Objective** | **Teaching Strategy** | **Assessment Strategy** | **Notes** |
| 7 | Ecological Pyramids | 1A. Fill out a worksheet of an energy pyramid and use the same principles to complete a biomass pyramid and pyramid of numbers.  1B. Complete a simulation to show the principles of these pyramids. | 1A. In-class assignment. | The worksheet needs to be created and printed out ahead of time. |
| 8 | Cycles of Matter | 1A. Complete activity in which students rotate around the room and rearrange cards to show the cycles.  1B. PowerPoint discussing cycles in nature. | 1A. In class assignments  1B. Quiz | Computer and projector needed. |
| 9 | Nutrient Limitation | 1A. Presentation and notes.  1B. Assignment in which students give an example of this and fully explain it.  1C. Possibly a lab to show this concept. | 1B. Lab assignment.  1C. Case study. | The lab must be prepared and set up ahead of time. |
| 10 | Review Day | Review quiz game | Game |  |
| 11 | Exam Day | Exam | Exam |  |

Use the table below to complete part 10 of your Unit Plan Assignment.

|  |  |  |  |
| --- | --- | --- | --- |
| Units Preceding This One | Reasoning | Unit Following This One | Reasoning |
| Cell structure and function | I would like students to have an understanding of how cells work so that we can look more closely into photosynthesis and chemosynthesis | I think I would present this unit at or near the end of the term | This unit deals with how organisms interact and if I were to structure my class moving from simpler to more complex, this would logically be the final unit |